Locality failover

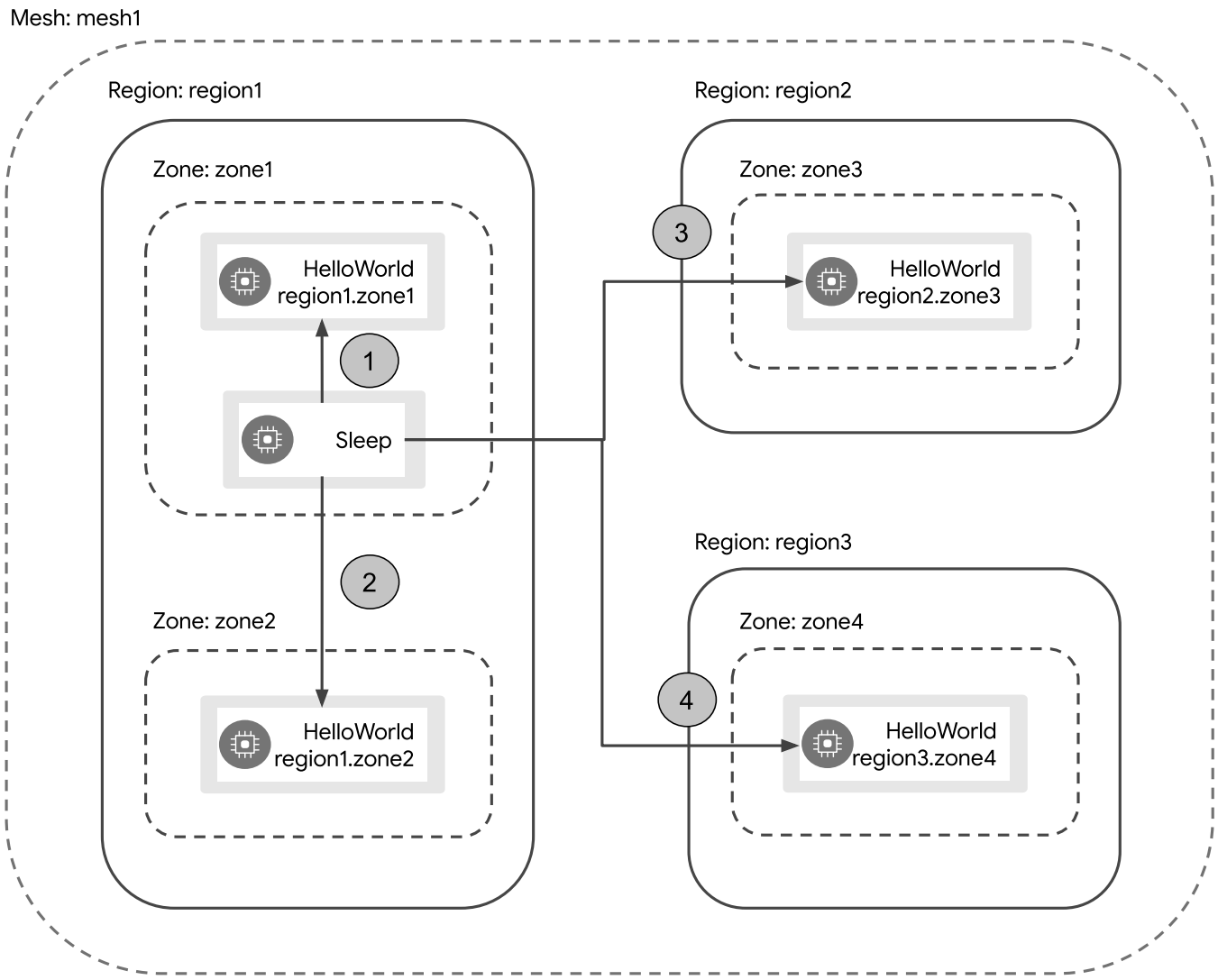
4 minute read ✔ page test

Follow this guide to configure your mesh for locality failover.

Before proceeding, be sure to complete the steps under before you begin.

In this task, you will use the `Sleep` pod in `region1.zone1` as the source of requests to the `HelloWorld` service.

You will then trigger failures that will cause failover between localities in the following sequence:



Locality failover sequence

Internally, Envoy priorities are used to control failover. These priorities will be assigned as follows for traffic originating from the `Sleep` pod (in `region1 zone1`):

Priority	Locality	Details
0	`region1.zone1`	Region, zone, and sub-zone all match.
1	None	Since this task doesn’t use

		sub-zones, there are no matches for a different sub-zone.
2	`region1.zone2`	Different zone within the same region.
3	`region2.zone3`	No match, however failover is defined for `region1`->`region2`.
4	`region3.zone4`	No match and no failover defined for `region1`->`region3`.

Configure locality failover

Apply a `DestinationRule` that configures the following:

- `Outlier detection` for the `HelloWorld` service. This is required in order for failover to function properly. In particular, it configures the sidecar proxies to know when endpoints for a service are unhealthy, eventually triggering a failover to the next locality.
- `Failover` policy between regions. This ensures that failover beyond a region boundary will behave predictably.

- Connection Pool policy that forces each HTTP request to use a new connection. This task utilizes Envoy's drain function to force a failover to the next locality. Once drained, Envoy will reject new connection requests. Since each request uses a new connection, this results in failover immediately following a drain. **This configuration is used for demonstration purposes only.**

```
$ kubectl --context="${CTX_PRIMARY}" apply -n sample -f - <<EOF
apiVersion: networking.istio.io/v1beta1
kind: DestinationRule
metadata:
  name: helloworld
```

```
spec:
  host: helloworld.sample.svc.cluster.local
  trafficPolicy:
    connectionPool:
      http:
        maxRequestsPerConnection: 1
    loadBalancer:
      simple: ROUND_ROBIN
      localityLbSetting:
        enabled: true
        failover:
          - from: region1
            to: region2
    outlierDetection:
      consecutive5xxErrors: 1
      interval: 1s
      baseEjectionTime: 1m
EOF
```

Verify traffic stays in `region1.zone1`

Call the `HelloWorld` service from the `Sleep` pod:

```
$ kubectl exec --context="${CTX_R1_Z1}" -n sample -c sleep \
  "$(kubectl get pod --context="${CTX_R1_Z1}" -n sample -l \
  app=sleep -o jsonpath='{.items[0].metadata.name}')" \
  -- curl -sSL helloworld.sample:5000/hello
Hello version: region1.zone1, instance: helloworld-region1.zone1
-86f77cd7b-cpxhv
```

Verify that the `version` in the response is `region1.zone`.

Repeat this several times and verify that the response is always the same.

Failover to `region1.zone2`

Next, trigger a failover to `region1.zone2`. To do this, you drain the Envoy sidecar proxy for `HelloWorld` in `region1.zone1`:

```
$ kubectl --context="${CTX_R1_Z1}" exec \
  "$(kubectl get pod --context="${CTX_R1_Z1}" -n sample -l app=h
elloworld \
  -l version=region1.zone1 -o jsonpath='{.items[0].metadata.name
}')" \
  -n sample -c istio-proxy -- curl -sSL -X POST 127.0.0.1:15000/
drain_listeners
```

Call the `HelloWorld` service from the `Sleep` pod:

```
$ kubectl exec --context="${CTX_R1_Z1}" -n sample -c sleep \
  "$(kubectl get pod --context="${CTX_R1_Z1}" -n sample -l \
  app=sleep -o jsonpath='{.items[0].metadata.name}')" \
  -- curl -sSL helloworld.sample:5000/hello
Hello version: region1.zone2, instance: helloworld-region1.zone2
-86f77cd7b-cpxhv
```

The first call will fail, which triggers the failover. Repeat the command several more times and verify that the `version` in the response is always `region1.zone2`.

Failover to `region2.zone3`

Now trigger a failover to `region2.zone3`. As you did previously, configure the `HelloWorld` in `region1.zone2` to fail when called:

```
$ kubectl --context="${CTX_R1_Z2}" exec \
  "$(kubectl get pod --context="${CTX_R1_Z2}" -n sample -l app=h
elloworld \
  -l version=region1.zone2 -o jsonpath='{.items[0].metadata.name
}')" \
  -n sample -c istio-proxy -- curl -sSL -X POST 127.0.0.1:15000/
drain_listeners
```

Call the `HelloWorld` service from the `Sleep` pod:

```
$ kubectl exec --context="${CTX_R1_Z1}" -n sample -c sleep \
  "$(kubectl get pod --context="${CTX_R1_Z1}" -n sample -l \
  app=sleep -o jsonpath='{.items[0].metadata.name}')" \
  -- curl -sSL helloworld.sample:5000/hello
Hello version: region2.zone3, instance: helloworld-region2.zone3
-86f77cd7b-cpxhv
```

The first call will fail, which triggers the failover. Repeat the command several more times and verify that the `version` in the response is always `region2.zone3`.

Failover to `region3.zone4`

Now trigger a failover to `region3.zone4`. As you did previously, configure the `HelloWorld` in `region2.zone3` to fail when called:

```
$ kubectl --context="${CTX_R2_Z3}" exec \
  "$(kubectl get pod --context="${CTX_R2_Z3}" -n sample -l app=h
elloworld \
  -l version=region2.zone3 -o jsonpath='{.items[0].metadata.name
}')" \
  -n sample -c istio-proxy -- curl -sSL -X POST 127.0.0.1:15000/
drain_listeners
```

Call the `HelloWorld` service from the `Sleep` pod:

```
$ kubectl exec --context="${CTX_R1_Z1}" -n sample -c sleep \
  "$(kubectl get pod --context="${CTX_R1_Z1}" -n sample -l \
  app=sleep -o jsonpath='{.items[0].metadata.name}')" \
  -- curl -sSL helloworld.sample:5000/hello
Hello version: region3.zone4, instance: helloworld-region3.zone4
-86f77cd7b-cpxhv
```

The first call will fail, which triggers the failover. Repeat the command several more times and verify that the `version` in the response is always `region3.zone4`.

Congratulations! You successfully configured locality failover!

Next steps

`Cleanup` resources and files from this task.